

CLAIMS

What is claimed is:

- 1 1. An assembly for a die comprising:
2 a lid; and
3 a solderable thermally conductive element to couple a die to the lid.
- 1 2. The assembly recited in claim 1 wherein the lid comprises material from the
2 group consisting of copper and aluminum-silicon-carbide.
- 1 3. The assembly recited in claim 1 wherein the solderable thermally conductive
2 element comprises material, including one or more alloys, from the group consisting
3 of tin, bismuth, silver, indium, and lead.
- 1 4. The assembly recited in claim 1 wherein the lid comprises at least one metal
2 or organic layer to which the thermally conductive element can be coupled.
- 1 5. The assembly recited in claim 4 wherein the at least one metal or organic
2 layer comprises nickel or gold.
- 1 6. The assembly recited in claim 1 and further comprising:
2 a die comprising at least one metal layer to which the solderable thermally
3 conductive element can be coupled.
- 1 7. The assembly recited in claim 6 wherein the at least one metal layer
2 comprises material, including one or more alloys, from the group consisting of
3 titanium, chromium, zirconium, nickel, vanadium, and gold.
- 1 8. An integrated circuit package comprising:
2 a substrate;
3 a die positioned on a surface of the substrate;
4 a lid positioned over the die; and
5 a solderable thermally conductive element coupling the die and the lid.

1 9. The integrated circuit package recited in claim 8 wherein the lid comprises a
2 support member coupled to the substrate.

1 10. The integrated circuit package recited in claim 8 wherein the lid comprises
2 material from the group consisting of copper and aluminum-silicon-carbide.

1 11. The integrated circuit package recited in claim 8 wherein the lid comprises at
2 least one metal or organic layer to which the thermally conductive element is
3 coupled.

1 12. The integrated circuit package recited in claim 11 wherein the at least one
2 metal or organic layer comprises nickel or gold.

1 13. The integrated circuit package recited in claim 8 wherein the solderable
2 thermally conductive element comprises material, including one or more alloys,
3 from the group consisting of tin, bismuth, silver, indium, and lead.

1 14. The integrated circuit package recited in claim 8 wherein the substrate is an
2 organic substrate and wherein the die is coupled to the substrate through a land grid
3 array.

1 15. The integrated circuit package recited in claim 8 wherein the die comprises
2 at least one metal layer to which the thermally conductive element is coupled.

1 16. The integrated circuit package recited in claim 15 wherein the at least one
2 metal layer comprises material, including one or more alloys, from the group
3 consisting of titanium, chromium, zirconium, nickel, vanadium, and gold.

1 17. An electronic assembly comprising:
2 at least one integrated circuit package comprising:
3 a substrate;
4 a die positioned on a surface of the substrate;
5 a lid positioned over the die; and

6 a solderable thermally conductive element coupling the die and the lid.

1 18. The electronic assembly recited in claim 17 wherein the lid comprises a
2 support member coupled to the substrate.

1 19. The electronic assembly recited in claim 17 wherein the solderable thermally
2 conductive element comprises material, including one or more alloys, from the
3 group consisting of tin, bismuth, silver, indium, and lead.

1 20. The electronic assembly recited in claim 17 wherein the substrate is an
2 organic substrate and wherein the die is coupled to the substrate through a land grid
3 array.

1 21. An electronic system comprising an electronic assembly having at least one
2 integrated circuit package comprising:

3 a substrate;

4 a die positioned on a surface of the substrate;

5 a lid positioned over the die; and

6 a solderable thermally conductive element coupling the die and the lid.

1 22. The electronic system recited in claim 21 wherein the solderable thermally
2 conductive element comprises material, including one or more alloys, from the
3 group consisting of tin, bismuth, silver, indium, and lead.

1 23. The electronic system recited in claim 21 wherein the substrate is an organic
2 substrate, wherein the die is coupled to the substrate through a land grid array, and
3 wherein the lid comprises a support member coupled to the substrate.

1 24. A data processing system comprising:

2 a bus coupling components in the data processing system;

3 a display coupled to the bus;

4 external memory coupled to the bus; and

5 a processor coupled to the bus and comprising an electronic assembly
6 including at least one integrated circuit package comprising:
7 a substrate;
8 a die positioned on a surface of the substrate;
9 a lid positioned over the die; and
10 a solderable thermally conductive element coupling the die and the
11 lid.

1 25. The data processing system recited in claim 24 wherein the solderable
2 thermally conductive element comprises material, including one or more alloys,
3 from the group consisting of tin, bismuth, silver, indium, and lead.

1 26. The data processing system recited in claim 24 wherein the substrate is an
2 organic substrate and wherein the die is coupled to the substrate through a land grid
3 array.

1 27. A method of fabricating an integrated circuit package, the method
2 comprising:
3 forming at least one metal layer on a surface of a die;
4 mounting the die on a substrate;
5 positioning a surface of a lid adjacent the layer of solder material; and
6 applying solder material between the at least one metal layer and the surface
7 of the lid;
8 melting the solder material to physically couple the lid to the die.

1 28. The method recited in claim 27 wherein the solder material has a relatively
2 high thermal conductivity and a relatively low melting point.

1 29. The method recited in claim 27 wherein the substrate comprises organic
2 material having a relatively high thermal coefficient of expansion relative to that of
3 the die.

1 30. The method recited in claim 27 and further comprising forming at least one
2 metal or organic layer on the surface of the lid prior to applying solder
3 material.